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U. S. DEPARTMENT OF INTERIOR
DIVISION OF GRAZING

A FIELD METHOD OF JUDGING RANGE UTILIZATION

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The successful management of grazing lands depends to a considerable extent on intimate knowledge of the condition of the important forage plants and the soil in which they grow. Ranges normally show some distinct evidence of variation occurring from year to year under the existing conditions of plant growth and livestock use. Periodic checks of current utilization which record definitely the conditions observed on the ranges afford a means for determining the trends of improvement, stability or decline in range values. Comparison of the findings of utilization checks over a period of years with records of livestock use actually made affords a reliable method of measuring the grazing capacity of any particular unit of range lands. Such information furnishes a sound basis for adjustments in livestock management.

Several methods of judging range utilization are in use by range managers. These include random estimates of percent of use made of all forage, judging or measuring the use made of certain "indicators" or "key species", judging results of use by relation to condition of livestock, and judging the volume of forage taken or left after grazing. Each method may be especially adapted to certain kinds of range or to use by men with certain training. It is believed that any method which makes definite records of the conditions observed, which can be used by different individuals with fairly uniform results, and which will give an opportunity for direct comparisons year after year, will serve the purposes.

The following-described method (for convenience, called "Primary Forage Plant Method"), has been successfully tried in the field and seems to meet the needs of the Division of Grazing for a procedure adapted particularly to the use of administrative officers in charge of range. It is a convenient adaptation of certain principles long used by range examiners.

The Primary Forage Plant Method is based on the principle of recording at the close of a grazing season, specific information about each of the main forage plants which carry the principal load of grazing use on a range area, describing briefly the other factors which influence the use made, and considering all these to reach a conclusion which assigns the area to one of nine described classes of degree of use. A sufficient number of such observations are made within an administrative unit to afford a picture of what is

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happening to the whole area under existing conditions of use. To give an opportunity for subsequent examinations for comparative purposes, the location of each observation station is described and platted on a map. These map locations also show diagrammatically the approximate portions of the unit subjected to different degrees of grazing use, which gives a key to where corrective management adjustments are necessary.

After the conclusions reached for the several observation locations within a unit have been summarized into a consolidated report for the unit, the findings are compared with data on the actual use made on that unit by livestock during the preceding grazing season. From these results significant carrying capacity figures may be determined for the unit.

RECORDS SECURED AT EACH OBSERVATION LOCATION

The number of locations at which observations are taken will naturally vary with the local conditions and problems presented in the area to be examined. The notes taken at each observation location selected within a study area should contain specific data on the following points as a minimum requirement for useful records. Elaboration of these to amplify information may, of course, be made to any extent considered desirable.

1. The location of each observation taken should be described definitely and tied in to known points, as a requisite for fixing the position on a map and for return for future examinations.

2. Decide which are the forage plants in this particular locality that are carrying the major load of grazing use. (Usually not more than a half dozen species are particularly important). Consider as primary species those which obviously are the dominant plants from a forage production standpoint. Consider as secondary plants those which are present in sufficient amount to contribute materially to the forage production.

3. Describe the relative abundance, extent of grazing, appearance of condition and vigor, and the mortality or reproduction evidence for each of these most important species. Consider also the poisonous or other relatively undesirable plants present in sufficient amounts to affect management of the area.

4. Describe what is happening to soil of the locality from standpoint of its productiveness and retention in place. The natural character and qualities of soil in the particular location must be considered. Describe briefly such evidence of erosion activity as undue removal of soil by wind or water, elevated position above surrounding soil surface of shrub or grass clumps (pedestals), extent of bare soil surface exposed, presence or absence of litter and humas.

5. Describe other significant natural or induced factors that influence the use or management of the locality for livestock. Consider such features as character of topography, distribution of water, position with reference to lands in other control, place in seasonal operations, methods of control of use, rodent infestation, game use, recent fires, et cetera.

6. Describe how the physical conditions of site and forage plants now existing as a result of former use affect the present and future use. Ranges in good condition must be maintained, depleted ranges must be improved.

7. Considering all pertinent factors decide in what described class of use the existing conditions place the area. Distinguish carefully between the cumulative effects of use over a period of years, and the direct effect of the current year's use.

The field notes for these observations may be taken in a pocket notebook, and later transferred to proper file records, or made directly on a form which has been developed for the purpose. (See attached sample.)

For the reason that two individuals examining range will seldom estimate exactly the same by the use of percentages; nine typical classes of use, each described by appropriate terms, are established. It is believed that two individuals would nearly always agree in judgment within the limits of definition of each class. By the use of uniform terms of description for certain conditions confusion in the reports of different individuals will be avoided, and uniformity and continuity of records will be guaranteed.

A standard term consisting of a single word is used to show each relative degree of under-utilization, correct utilization, or over-utilization. A map index symbol consisting of a two-letter abbreviation of the term, or a numerical index scale stepping from 0 to 200 is used to mark the class of use for any location on the unit map.

It should be emphasized that each condition observed for each factor is only one indicator or clue to be weighed with reference to several other factors. The ultimate conclusion reached is determined only after consideration of the several influence factors giving to each its proportionate value.

The classification of degrees of use follows:

Map Index			
No.	or Symbol	Term	Description of Typical Conditions
0	Un	Unused:	No evidence of use by livestock.
25	Sl	Slight:	Range has appearance of drift or casual grazing only. Many of choicest plants are untouched; good forage plants are selec-

Map Index No. or Symbol		Term	
			tively used; no use of less desirable plants; seed stalks of primary plants and young plants are little disturbed.
50	Li	Light:	Range has appearance of "topping" or "skimming" use only, or only most convenient parts of area may be grazed in "patches". Generally only certain plants of choice or good value are being selected, while low value plants are untouched; seed stalks of primary plants abundant, most young plants intact.
75	Mo	Moderate:	Most of range appears to have been covered to some extent. Choicest plants may be fully used, good forage plants are supplying most of the forage used; very little, if any, use is made of low value plants; seed stalks of primary plants are plentiful; many young plants are intact.
100	Pr	Proper:	Range appears entirely covered as uniformly as natural features and facilities will allow. Occasional or very choice "ice cream" plants may be completely taken, but on primary forage plants a sufficient amount of the current year's growth has been left to assure future maintenance (for most shrubs about 1/3 of current growth, for most grasses and weeds at least 1/5 should remain unused). Use of low value or less desirable plants usually slight; some seed stalks of primary plants are left; some young plants are intact. (The real objective here is to be sure that ranges with choice and good forage plants or average ranges under average growth conditions are able to maintain themselves indefinitely without undue wastage of usable forage. Depleted ranges should improve, perhaps slowly, under growth conditions).
125	Cl	Close:	Range has appearance of complete search often with repetition of use on some parts. Many primary forage plants are used to extent of leaving less than 1/3 to 1/5 of current year's growth; choice and good forage plants are rather completely used, with some use of plants low in forage value; seed stalks on primary plants are few, a few young plants are left intact. (Under this degree of use it is expected that ranges in average condition will gradually decline. Improvement of

Map Index No. or Symbol		Term	
			depleted ranges is questionable, or will occur only in favorable seasons).
150	Se	Severe:	Range has mown or hedged appearance, with indications of repetition in use and some trampling damage in patches of concentration. Primary forage plants have current growth almost completely taken, removing the maintenance safeguard; choice and good forage plants have been injuriously used; low value plants are carrying much of the grazing load; seed stalks on primary forage plants are only occasional, while few, if any young plants are left uninjured; shrub clumps may be slightly broken, sod grass turfs often appear broken up. (The range capital is being drawn upon. Ranges in average condition will decline or show improvement only in unusually favorable seasons).
175	Ex	Extreme:	Range generally has a "clean swept" or "stripped" appearance with indications of repeated coverage in search for forage so that trampling injury is very evident. Primary forage plants have been grazed with definitely injurious effects; choice plants and good forage plants appear largely as remnants with some recently killed; even low value plants are closely taken and universally used; shrub clumps are broken into; turfs of sod grasses are broken up or "hashed". Inter-shrub spaces of shrub types have soil packed and undesirable annuals appear as new growth. There is practically no evidence of reproduction possibilities on primary plants from seed stalks or young plants left uninjured. (Ranges in average condition will deteriorate rapidly).
200	De	Destructive:	Range appears "grubbed" rather than grazed. Primary forage plants show much d death loss. Only remnants of choice or good plants are present, even low value plants are closely taken and universally used; trampling injury and plant removal are often sufficient to cause active soil movement by washing or blowing or by creeping on slopes. Range is in a critical state.

Use of Maps

After field observations are completed, the approximate location of each observation station should be platted on a suitable map, with the conclusion as to class of use indicated by symbol or numeral for each location. The zones of different degrees of use are then made apparent by diagram to assist in analysis for a summary report for the entire unit. (Sample map attached). Preferably the maps used should be of small scale or diagram type so that filing with unit reports is readily done. Separate maps will necessarily be prepared each year.

Report for a Grazing Unit

For any unit of range chosen for utilization study (which may be a single allotment, a seasonal zone area, or an administrative division), there must be records taken at a sufficient number of locations to give a reasonable sample of use over the whole area. The information from all observation locations considered should be summarized and consolidated into a report for the unit as a whole.

This report should contain enough description to give a generalized concept of the situation to anyone unfamiliar with the detail of the country. It should show the comparative intensity of the examination, report the results of broad analysis of the situation giving reasons for unusual features, draw general conclusions as to trends and make specific recommendations for management procedure and range improvements as are indicated by the findings. A statement of climatic conditions, particularly where these have materially affected plant growth, or modified livestock use of the area, should be made. A statement of past conditions and history of former use is needed to show the trend of cumulative influence which will govern present and future management. Usually, unsatisfactory conditions which indicate "problem areas" will require more detailed comment, but satisfactory conditions with the reasons for them should receive full attention.

Records of Actual Use of the Unit

The report of existing conditions for the unit should be tied in with a record of the actual use being made of the area by livestock. Every available source of information concerning actual use obtained in the unit should be developed. Counts of livestock on the range, estimates of trespass, records of trailing or transient use, game counts, and reliable information secured from operators are the usual sources.

The minimum record secured concerning actual use should include a statement of the number and kind of livestock grazed, the inclusive dates of all grazing use obtained within the unit, and the use made, if any, of supplemental feeds. Desirable additions to this information are statements of the condition of livestock on entering and leaving, lamb and wool production data, calf crop or class of cattle product data, losses of livestock on the range and the contributory causes.

A method of tabulating the pertinent information for a range unit which shows the correlation of the permitted use, actual use, and the results of utilization checks, is illustrated in an attached exhibit. The tabulation provides for recording, in a manner which permits direct comparison, the details of permitted use and actual use for each operator, the acreage of area concerned, and the conclusion as to degree of utilization. The information on permitted use is secured from administrative records of licenses or permits issued; actual use data are secured from the various sources of counts and interviews which may be used locally; acreage of the area is derived from map and land status records; conclusions as to use are taken from the field utilization checks.

The same method of tabulation may be used for summarizing the information concerning several subdivisions of a major range division into a report for the whole unit. The direct relationship between records of current utilization and records of actual use made is the all important feature to be emphasized for each range unit.

General Comment and Suggestions

This method of judging and classifying range utilization provides a means of making uniform records with a minimum of written description of detail. It consolidates the considered findings concerning several inter-related factors into a single significant term. For this reason careful weighing of the relative importance of each separate factor of influence is necessary. Likewise the exercise of careful judgment is necessary in summarizing the results of findings over the study unit in order to present a properly correlated statement for the whole.

The method is designed for use at the close of any grazing season, consequently examinations should be made promptly after livestock leave, so that subsequent growth will not obscure the evidence of use. Different types of seasonal range and plant associations will show many different characteristics of reaction to grazing use. No attempt has been made to describe all these variations in the typical class definitions since few of them are absolute except under fixed circumstances. Continuous study with proper records of observations will gradually develop the characteristic features for any particular range unit so that the essentials will become clear for proper classification, and the significant factors for management can be emphasized.

In making observations on plant reproduction it should be borne in mind that successful reproduction every year cannot be expected. The combination of a good seed year with favorable climatic conditions for seed germination and survival of seedlings during the following season may occur only at infrequent intervals. Further, many plants do not depend on seed as a means of reproduction. However, over a period of years there must be some survival of young plants to form replacements for death losses. Most perennial plant stands should normally contain some plants of all ages from seedling to maturity.

In making observations on death losses of plants, careful distinction should be made between plants recently killed and those which were previously killed but remain standing. Mortality from other causes than grazing such as disease, insects, fire, rodents, drought, frost, etc., should be noted.

On ranges which are in a depleted condition especially careful differentiation should be made between the effects of grazing use during the current season and the effects of former grazing use which are cumulative in many respects.

When climatic factors are considered, the records of several nearby weather stations should be consulted and correlated wherever possible. The records of a single station may give an exaggerated idea if applied over a large area since abrupt variations in climate are characteristic of many western range areas. The timeliness and distribution of rainfall is much more significant than the total amount of precipitation.

Clear photographs of the details of vegetation at definitely-located positions afford valuable records for comparison. General photographs also assist in illustration of pertinent features of geography and topography.

On range areas with which the examiner is unfamiliar in detail a preliminary scouting to obtain the broad relations of seasonal use, water distribution, migration routes, and barriers, is advisable before observation locations are selected.

Car travel mileage records assist in describing the position of observation stations where maps are lacking in adquate control points.

Valuable comparisons of range potentials are often afforded by unused or protected areas: Cemeteries, railroad rights-of-way, field corners, canyon shelves, or fenced demonstration plots may serve in this respect. Examinations of range in advance of grazing use also are useful for comparison purposes.

U. S. D. A. Bulletin #1782, "Indicators of Southwestern Range Conditions," by M. W. Talbot, affords a valuable reading reference discussion of judging range conditions.

It is suggested that in filing of utilization check reports an arrangement by administrative units of grazing districts would be most useful. All field records of observations should be observed since these will provide a reference of great historical value.

The examiner of range in making utilization checks should endeavor to provide specific information in records, uniform description of conditions, good reasons for unusual situations, and careful interpretations of the relationship of all the factors on which his recommendations for range management are based.

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